

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patent Application

Applicant(s): Sayeed et al.
Case: 18
Serial No.: 09/826,399
Filing Date: April 3, 2001
Group: 2634
Examiner: Ted M. Wang

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Signature: [Signature] Date: October 28, 2005

Title: Method and Apparatus for Adjusting the Gain of an IF Amplifier in a Communication System



TRANSMITTAL OF APPEAL BRIEF

Mail Stop Appeal Brief
Commissioner of Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Submitted herewith are the following documents relating to the above-identified patent application:

1. Appeal Brief; and
2. Copy of Notice of Appeal, filed on August 26, 2005, with copy of stamped return postcard indicating receipt of Notice by PTO on August 29, 2005.

There is an additional fee of \$500 due in conjunction with this submission under 37 CFR §1.17(c). Please charge **Deposit Account No. 50-0762** the amount of \$500, to cover this fee. In the event of non-payment or improper payment of a required fee, the Commissioner is authorized to charge or to credit **Deposit Account No. 50-0762** as required to correct the error. A duplicate copy of this letter is enclosed.

Respectfully submitted,

[Signature: Kevin M. Mason]

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Date: October 28, 2005



Sayed 18

UNITED STATES PATENT AND TRADEMARK OFFICE

Patent Application

Applicant(s): Zulfiquar Sayeed
Case: 18
Serial No.: 09/826,399
Filing Date: April 30, 2001
Group: 2634
Examiner: Ted M. Wang

I hereby certify that this paper is being deposited on this date with the U.S. Postal Service as first class mail addressed to the Commissioner for Patents, P.O. 1450, Alexandria, VA 22313-1450

Signature: *Jim Mouni* Date: October 28, 2005

Title: Method and Apparatus for Adjusting the Gain of an IF Amplifier in a Communication System

APPEAL BRIEF

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Applicant hereby appeals the final rejection dated April 21, 2005, of claims 1 through 9 of the above-identified patent application.

REAL PARTY IN INTEREST

The present application is assigned to Agere Systems Inc., as evidenced by an assignment recorded on April 3, 2001 in the United States Patent and Trademark Office at Reel 011695, Frame 0890, and by an assignment under 37 CFR 3.73(b) dated April 16, 2003. The assignee, Agere Systems Inc., is the real party in interest.

RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences.

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STATUS OF CLAIMS

Claims 1 through 17 are presently pending in the above-identified patent application. Claim 1 remains rejected under 35 U.S.C. §102(e) as being anticipated by Earls et al. (United States Patent Number 6,532,358). Claims 2, 4, and 6 remain rejected
5 under 35 U.S.C. §103(a) as being unpatentable over Earls et al. in view of Okamoto (United States Patent Number 6,614,855), claim 3 remains rejected under 35 U.S.C. §103(a) as being unpatentable over Earls et al. in view of Marchok et al. (United States Patent Number 5,790,514), and claim 9 remains rejected under 35 U.S.C. §103(a) as being unpatentable over Earls et al. in view of Okamoto, and further in view of Baldwin
10 et al. (United States Patent Number 6,735,422). The Examiner indicated that claims 5, 7, and 8 would be allowable if rewritten in independent form including all of the limitations of the base claims and any intervening claims, and that claims 10-17 are allowed.

STATUS OF AMENDMENTS

15 There have been no amendments filed subsequent to the final rejection.

SUMMARY OF CLAIMED SUBJECT MATTER

The present invention is directed to an automatic gain control technique for adjusting the gain of an IF amplifier in a communication system, such as an OFDM or
20 DMT communication system (page 4, line 24, to page 5, line 24). The gain of an RF amplifier is controlled by a known RF automatic gain control circuit that generates an RF gain value (page 5, line 25, to page 6, line 4). The disclosed IF automatic gain control (AGC) circuit controls the gain of an IF amplifier in the receiver. The disclosed IF AGC monitors the RF gain value, as well as pre-FFT and post-FFT signal energy
25 measurements performed before and after a fast Fourier transform (FFT) stage, respectively, to maintain a desired set point (page 6, lines 5-13). The IF AGC adjusts the previous IF gain value by an amount opposite to the adjusted RF gain value, if any (page 6, lines 14-22). If there is no RF gain adjustment, then the IF AGC will adjust the IF gain based on thresholds established for the pre-FFT and post-FFT measurements. If the pre-
30 FFT measurement is within a desired tolerance of the pre-FFT threshold, then the IF gain will be lowered in stepped increments. Otherwise, the IF gain adjustment is the

minimum of the difference between (i) the pre-FFT measurement and its threshold, or (ii) the post-FFT measurement and its threshold, multiplied by a loop gain constant (page 20, line 1, to page 21, line 6).

5 STATEMENT OF GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claim 1 is rejected under 35 U.S.C. §102(e) as being anticipated by Earls et al. Claims 2, 4, and 6 are rejected under 35 U.S.C. §103(a) as being unpatentable over Earls et al. in view of Okamoto, claim 3 is rejected under 35 U.S.C. §103(a) as being unpatentable over Earls et al. in view of Marchok et al., and claim 9 is rejected under 35
10 U.S.C. §103(a) as being unpatentable over Earls et al. in view of Okamoto, and further in view of Baldwin et al.

ARGUMENT

Independent Claim 1

15 Independent claim 1 was rejected under 35 U.S.C. §102(e) as being anticipated by Earls et al.

Regarding claim 1, the Examiner asserts that Earls discloses adjusting said IF gain value (FIG. 1, element 22, and col. 3, lines 1-42) based on said monitored RF amplifier gain adjustment (FIG. 1, elements 14, 22, 26, 28, and 30; FIG. 3; and col. 3,
20 line 17, to col. 4, line 4) by an amount approximately opposite to said RF gain value (FIG. 1, elements 24 and 30; and col. 3, line 1, to col. 4, line 4).

Applicant notes that, in the text cited by the Examiner, Earls teaches that the gains (IF and Wideband) are set during three specific steps (see, FIG. 3). Regarding the first step (entitled “SET WIDEBAND GAIN”), Earls teaches that

25 the controller 30 reads the output from the wideband detector 26, 28 and *sets a gain control value for the wideband variable gain input amplifier 14 in order to provide a nominal amplitude of the RF signal to the mixer stage 18.*
(Col. 3, lines 38-42.)

30 Regarding the second step (entitled “SET IF GAIN”), Earls teaches that
the controller 30 reads the output from the IF detector 24
and sets a gain control value for the IF amplifier 22 to provide a

maximum amplitude value for the IF signal to put it close to full scale for the analog-to-digital converter (A/D) in the IF detector.
(Col. 3, lines 43-47.)

5 Regarding the third step (entitled “RE-OPTIMIZE WB AND IF GAINS”),
Earls teaches that

the respective gains of the wideband and IF amplifiers may
be re-optimized by *increasing the IF gain by the specified dBm and
decreasing the wideband gain by the specified dBm.*
10 (Col. 3, lines 59-62.)

Earls, however, does not disclose or suggest adjusting an IF gain value
based on a monitored RF amplifier gain adjustment *by an amount approximately
opposite to the RF gain value.* Independent claim 1, as amended, requires “adjusting
15 said IF gain value *based on said monitored RF amplifier gain adjustment by an amount
approximately opposite to said RF gain value.*”

Thus, Earls et al. do not disclose or suggest adjusting said IF gain value
based on said monitored RF amplifier gain adjustment by an amount approximately
opposite to said RF gain value, as required by independent claim 1.

20 Additional Cited References

Okamoto was also cited by the Examiner for its disclosure of a receiver
for receiving broadcasting signals with an OFDM communication receiver. Okamoto
does not disclose or suggest, however, adjusting an IF gain value based on an RF gain
adjustment.

25 Thus, Okamoto does not disclose or suggest adjusting said IF gain value
based on said monitored RF amplifier gain adjustment by an amount approximately
opposite to said RF gain value, as required by independent claim 1.

Marchok et al. were also cited by the Examiner for its disclosure of a
receiver for receiving broadcasting signals with a DMT communication receiver.
30 Marchok does not disclose or suggest, however, adjusting an IF gain value based on an
RF gain adjustment.

Thus, Marchok et al. do not disclose or suggest adjusting said IF gain
value based on said monitored RF amplifier gain adjustment by an amount approximately

opposite to said RF gain value, as required by independent claim 1.

Baldwin et al. was also cited by the Examiner for its disclosure of a threshold for said signal energy measurement (that) is established to prevent clipping. Baldwin et al. does not disclose or suggest, however, adjusting an IF gain value based on an RF gain adjustment.

Thus, Baldwin et al. do not disclose or suggest adjusting said IF gain value based on said monitored RF amplifier gain adjustment by an amount approximately opposite to said RF gain value, as required by independent claim 1.

Claim 4

Claim 4 was rejected under 35 U.S.C. §103(a) as being unpatentable over Earls et al. in view of Okamoto. In particular, the Examiner asserts that Okamoto discloses adjusting said IF gain value (FIG. 2: element SSG) based on at least one signal energy measurement (FIG. 2: element 29 and col. 6, lines 40-50) performed before or after a fast Fourier transform (FFT) stage in said receiver in order to maintain a desired set point.

Applicant notes that Okamoto, however, does not disclose or suggest adjusting an IF gain value based on at least one signal energy measurement performed before or after a fast Fourier transform (FFT) stage in a receiver *in order to maintain a desired set point if there is no RF gain adjustment*. Claim 4 requires adjusting said IF gain value based on at least one signal energy measurement performed before or after a fast Fourier transform (FFT) stage in said receiver *in order to maintain a desired set point if there is no RF gain adjustment*.

Thus, Earls et al., Okamoto, Marchok et al., and Baldwin et al., alone or in any combination, do not disclose or suggest adjusting said IF gain value based on at least one signal energy measurement performed before or after a fast Fourier transform (FFT) stage in said receiver in order to maintain a desired set point if there is no RF gain adjustment, as required by claim 4.

Conclusion

The rejections of the cited claims under section 102 and 103 in view of Earls et al., Okamoto, Marchok et al., and Baldwin et al., alone or in any combination, are

therefore believed to be improper and should be withdrawn. The Examiner has already indicated that claims 5, 7, and 8 would be allowable if rewritten in independent form including all of the limitations of the base claims and any intervening claims, and that claims 10-17 are allowed. The remaining rejected dependent claims are believed allowable for at least the reasons identified above with respect to the independent claims.

The attention of the Examiner and the Appeal Board to this matter is appreciated.

Respectfully,



Date: October 28, 2005

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APPENDIX

1. In a communication receiver, a method for adjusting the gain of an IF amplifier, said method comprising the steps of:

5 monitoring a gain adjustment of an RF amplifier in said communication receiver; and

 adjusting said IF gain value based on said monitored RF amplifier gain adjustment by an amount approximately opposite to said RF gain value.

10 2. The method according to claim 1, wherein said communication receiver is an OFDM communication receiver.

 3. The method according to claim 1, wherein said communication receiver is a DMT communication receiver.

15 4. The method according to claim 1, further comprising the step of adjusting said IF gain value based on at least one signal energy measurement performed before or after a fast Fourier transform (FFT) stage in said receiver in order to maintain a desired set point if there is no RF gain adjustment.

20 5. The method according to claim 4, wherein said signal energy measurement is a sum over n values of the squares of the real and imaginary portions of signal samples, where n corresponds to an inverse of an update rate (UR).

25 6. The method according to claim 4, wherein said signal energy measurement is performed before said FFT stage and wherein said method further comprises the step of adjusting said IF gain value in stepped increments if a difference between said signal energy measurement and a corresponding pre-FFT threshold are within a predefined tolerance.

7. The method according to claim 4, wherein said signal energy measurements are performed before and after said FFT stage and wherein said method further comprises the step of adjusting said IF gain value by an amount equal to a minimum of a difference between a pre-signal energy measurement and a corresponding pre-FFT threshold and a difference between a post-signal energy measurement and a corresponding post-FFT threshold multiplied by a constant.

8. The method according to claim 4, wherein a threshold for said signal energy measurement is established to maximize a number of bits representing each sample.

9. The method according to claim 4, wherein a threshold for said signal energy measurement is established to prevent clipping.

10. In a communication receiver, a method for adjusting the gain of an IF amplifier, said method comprising the steps of:

monitoring signal energy measurements before and after a fast Fourier transform (FFT) stage in said receiver in order to maintain a corresponding set point;

establishing corresponding thresholds for each of said signal energy measurements; and

adjusting said IF gain value by an amount based on said signal energy measurements before and after said FFT stage and said corresponding thresholds.

11. The method according to claim 10, wherein said communication receiver is an OFDM communication receiver.

12. The method according to claim 10, wherein said communication receiver is a DMT communication receiver.

13. The method according to claim 10, wherein said signal energy measurements are a sum over n values of the squares of the real and imaginary portions of signal samples, where n corresponds to an inverse of an update rate (UR).

5 14. The method according to claim 10, further comprising the step of adjusting said IF gain value in stepped increments if a difference between said signal energy measurement performed before said FFT stage and a corresponding pre-FFT threshold are within a predefined tolerance.

10 15. The method according to claim 10, wherein said thresholds are established to maximize a number of bits representing each sample.

 16. The method according to claim 10, wherein said thresholds are established to prevent clipping.

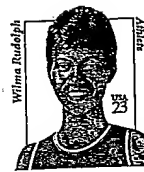
15 17. The method according to claim 10, wherein said adjusting step further comprises the step of selecting a minimum of a difference between said signal energy measurement before said FFT stage and said corresponding threshold and a difference between said signal energy measurement after said FFT stage and said corresponding
20 threshold.

EVIDENCE APPENDIX

There is no evidence submitted pursuant to § 1.130, 1.131, or 1.132 or entered by the Examiner and relied upon by appellant.

RELATED PROCEEDINGS APPENDIX

There are no known decisions rendered by a court or the Board in any proceeding identified pursuant to paragraph (c)(1)(ii) of 37 CFR 41.37.



Ryan, Mason & Lewis, LLP
ATTORNEYS AT LAW
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SUITE 205
FAIRFIELD, CT 06824

COPY

Receipt in the USPTO is hereby acknowledged of:

Transmittal Letter – (Original & 1 copy)
Notice of Appeal - (Original & 1 copy)
Petition for Extension of Time (one month)

Case Name: Sayeed 18
Serial No.: 09/826,399

1150-516

August 26, 2005 KMM

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**NOTICE OF APPEAL FROM THE EXAMINER TO THE
BOARD OF PATENT APPEALS AND INTERFERENCES**

Docket Number (Optional)

Sayed 18

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Signature Tina Maurice
Typed or printed name Tina Maurice

In re Application of

Sayed et al.

Application Number

09/826,399

Filed

April 3, 2001

For Method and Apparatus for Adjusting the Gain of an IF Amplifier in a Communication System

Group Art Unit

2634

Examiner

Ted M. Wang

Applicant hereby **appeals** to the Board of Patent Appeals and Interferences from the last decision of the examiner.

The fee for this Notice of Appeal is (37 CFR 1.17(b))

\$ 500.00

- ☐ Applicant claims small entity status. See 37 CFR 1.27. Therefore, the fee shown above is reduced by half, and the resulting fee is: \$ _____
- ☐ A check in the amount of the fee is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☐ The Commissioner has already been authorized to charge fees in this application to a Deposit Account. I have enclosed a duplicate copy of this sheet.
- ☒ The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment to Deposit Account No. 50-0762. I have enclosed a duplicate copy of this sheet.
- ☒ A petition for an extension of time under 37 CFR 1.136(a) (PTO/SB/22) is enclosed.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

I am the

- ☐ applicant/inventor.
- ☐ assignee of record of the entire interest.
See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)
- ☒ attorney or agent of record.
- ☐ attorney or agent acting under 37 CFR 1.34(a).
Registration number if acting under 37 CFR 1.34(a) _____

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Kevin M. Mason
Signature

Kevin M. Mason
Typed or printed name

August 26, 2005
Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

☐ *Total of _____ forms are submitted.

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